

## SECTION 4 WASTEWATER

### 4.1. Current Programs and Capacity

As previously described, the basis for the wastewater facilities' WLAs is contained in Virginia Code (§62.1-44.19:12) and two regulations: the Water Quality Management Planning Regulation (9 VAC 25-720) and the General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia (9 VAC 25-820), commonly referred to as the watershed general permit or nutrient trading regulation. These are enforceable provisions that "cap" the dischargers' TN and TP loads, and allow for nutrient credit exchange to achieve compliance. Additional reductions, below the current allocations in State regulations, are proposed from the significant dischargers in the James for total nitrogen and total phosphorus, and for total phosphorus in the York through more stringent treatment requirements. These modifications will be reflected in the Watershed General Permit and are further detailed after Table 4.1.1.

For the purpose of assigning nutrient WLAs, the bay wastewater facilities are designated either as "Significant" or "Nonsignificant Dischargers". These two classifications include both municipal and industrial facilities and are defined in state regulation as follows:

"Significant discharger" means (i) a point source discharger to the Chesapeake Bay watershed with a design capacity of 0.5 million gallons per day or greater, or an equivalent load; (ii) a point source discharger to the Chesapeake Bay watershed downstream of the fall line with a design capacity of 0.1 million gallons per day or greater, or an equivalent load; (iii) a planned or newly expanding point source discharger to the Chesapeake Bay watershed that is expected to be in operation by 2010 with a permitted design of 0.5 million gallons per day or greater, or an equivalent load; or (iv) a planned or newly expanding point source discharger to the Chesapeake Bay watershed downstream of the fall line with a design capacity of 0.1 million gallons per day or greater, or an equivalent load, that is expected to be in operation by 2010. (9 VAC 25-720-10)

"Non-significant discharger" means (i) a sewage treatment works discharging to the Chesapeake Bay watershed downstream of the fall line with a design capacity of less than 0.1 million gallons per day, or less than an equivalent load discharged from industrial facilities, or (ii) a sewage treatment works discharging to the Chesapeake Bay watershed upstream of the fall line with a design capacity of less than 0.5 million gallons per day, or less than an equivalent load discharged from industrial facilities. (9 VAC 25-820-10)

Under the watershed general permit, the Non-significant Dischargers with an individual VPDES permit were given a "Permitted Design Capacity", which is defined as follows:

"Permitted design capacity" or "permitted capacity" means the allowable load (pounds per year) assigned to an existing facility that is a nonsignificant discharger, that does not have a waste load allocation listed in 9VAC25-720-50 C, 9VAC25-720-60 C, 9VAC25-720-70 C, 9VAC25-720-110 C, and 9VAC25-720-120 C of the Water Quality Management Planning

Regulation. The permitted design capacity is calculated based on the design flow and installed nutrient removal technology (for sewage treatment works, or equivalent discharge from industrial facilities) at a facility that has either commenced discharge, or has received a Certificate to Construct (for sewage treatment works, or equivalent DEQ approval for discharges from industrial facilities) prior to July 1, 2005. This mass load is used for (i) determining whether the expanding facility must offset additional mass loading of nitrogen and phosphorus and (ii) determining whether the facility must acquire credits at the end of a calendar year. For the purpose of this regulation, facilities that have installed secondary wastewater treatment (intended to achieve BOD and TSS monthly average concentrations equal to or less than 30 milligrams per liter) are assumed to achieve an annual average total nitrogen effluent concentration of 18.7 milligrams per liter and an annual average total phosphorus effluent concentration of 2.5 milligrams per liter. Permitted design capacities for facilities that, before July 1, 2005, were required to comply with more stringent nutrient limits shall be calculated using the more stringent values. (9 VAC 25-820-10)

When Virginia's point source nutrient discharge control regulations were adopted in late 2005, the annual TN and TP WLA for Significant Dischargers were based on a combination of total design flow and stringent nutrient removal technology (NRT). The level of NRT applied to the regions of the Bay tributaries varied somewhat, in consideration of:

- delivery factors affecting loads discharged above the fall line and reaching tidal waters
- modeled water quality response and compliance with tidal water quality standards
- the combined size of the discharges and resulting loads
- available technology
- equivalent treatment in terms of comparable "level of effort" between municipal and industrial facilities

These assumed TN and TP annual average effluent concentrations were primarily\* used to calculate WLA for Significant Dischargers in the Water Quality Management Planning Regulation (9 VAC 25-720) adopted in 2005 with subsequent amendments and the Chesapeake Bay Watershed General Permit Regulation (9 VAC 25-820) adopted in 2006:

**Table 4.1.1: VA Basin Effluent Concentrations (mg/l) in Current Regulations**

Bay Tributary Region	Effluent TN Conc. (mg/l)	Effluent TP Conc. (mg/l)
Shenandoah and Potomac AFL	4.0	0.3
Potomac BFL	3.0	0.3
Rappahannock	4.0	0.3
York	6.0	0.7
James AFL	6.0	0.5
James Tidal Fresh	5.0	0.5
Lower James	12.7	1.0
Eastern Shore	4.0	0.3

Notes: “AFL” = above fall line; “BFL” = below fall line

\* - existing, more stringent permit limits were unaffected, and there were exceptions (e.g., Combined Sewer System localities, individual considerations for industrials)

Additional nitrogen reductions of about 2.6 mp/y are proposed in this Plan for the significant dischargers in the lower James basin, with an aggregate WLA for the Hampton Roads Sanitation District facilities based on an annual average TN concentration of 6.0 mg/l. An additional 0.45 mp/y phosphorus reduction will be required from the James’ significant dischargers that are publicly owned treatment plants based on an annual average TP concentration of 0.4 mg/l.

In the York basin, phosphorus loads are proposed to be further reduced from the significant dischargers that are publicly owned treatment plants based on an annual average TP concentration of 0.4 mg/l, along with an additional 20% reduction in the loads from significant industrial dischargers.

The current wastewater loading baseline, with earlier years presented to demonstrate progress achieved since the inception of the Chesapeake Bay Program, is presented in the following:

**Table 4.1.2: VA Basin Loads – Wastewater Sector Delivered Nitrogen Loads (million lbs/year)**

Basin	1985 TN Load	2002 TN Load	2009 TN Load	TN WLA
Shen.-Potomac	9.78	7.93	4.29	3.286
Rappahannock	0.61	0.58	0.39	0.475
York	1.43	1.21	1.17	0.957
James	24.72	16.09	14.09	13.565

Eastern Shore	0.35	0.21	0.22	0.04
Total	36.90	26.02	20.16	18.324

**Table 4.1.3: VA Basin Loads – Wastewater Sector Delivered Phosphorus Loads (million lbs/year)**

Basin	1985 TP Load	2002 TP Load	2009 TP Load	TP WLA
Shen.-Potomac	0.58	0.42	0.260	0.195
Rappahannock	0.20	0.10	0.043	0.042
York	0.46	0.17	0.106	0.157
James	4.17	1.73	0.953	1.088
Eastern Shore	0.05	0.03	0.004	0.003
Total	5.46	2.45	1.306	1.485

Virginia has adopted and implemented two permitting regulations to control wastewater nutrient discharges applicable to the Bay TMDL:

1. Nutrient Trading Regulation - 9 VAC 25-820-10 et seq  
General VPDES Watershed Permit Regulation for Total Nitrogen and Total Phosphorus Discharges and Nutrient Trading in the Chesapeake Bay Watershed in Virginia

The so-called “Nutrient Trading” Regulation or “watershed general permit” requires that all significant dischargers and any new or expanding non-significant discharger with an individual VPDES permit and a design flow of 0.04 MGD or more must register under the watershed general permit and meet an annual load limitation. These loads are capped and any expansion beyond the current wasteload allocation must be offset in accordance with the terms of the permit. This permit allows point sources to exchange TN and TP credits at the end of every calendar year as an extra measure to ensure compliance. New and expanding facilities may acquire wasteload allocations from other point sources or acquire non-point source offsets to accommodate future growth. 125 significant dischargers and 41 non-significant dischargers are currently included in the watershed general permit.

As described in the overview of Virginia’s plan at the beginning of this document, the enabling legislation also authorized the formation of the Virginia Nutrient Credit Exchange Association. Membership in The Exchange is voluntary and its role is to facilitate trading under the watershed general permit. To date, 46 Exchange member facilities have signed contracts guaranteeing TN and TP trades beginning in 2011. The combination of nutrient trading in a watershed general permit, the formation of The Exchange and an unprecedented investment in wastewater infrastructure has resulted in a robust market that will allow Virginia to meet its TN and TP aggregate wasteload allocation for the wastewater sector beginning in 2011. In addition, this existing

Virginia has a critical need under the TMDL to maintain the ability of dischargers to exchange or trade nutrient credits to comply with their WLA, as authorized under State law (VA Code §62.1-44.19:12). Trades are allowed among dischargers only within the

same basin with one exception. The 2010 General Assembly amended the credit exchange law to allow facilities on the Eastern Shore to acquire credits from dischargers in the Potomac and Rappahannock basins. TMDL implementation must recognize that trades among segment-shed TMDLs within each river basin are permitted, so long as local water quality is protected and the basin's total WLA is achieved.

2. Technology Regulation - 9 VAC 25-40-10 et seq  
Regulation for Nutrient Enriched Waters and Dischargers within the Chesapeake Bay Watershed

The so-called "Technology" Regulation requires the installation of minimum nutrient treatment technologies at new or expanding facilities in the Chesapeake Bay watershed and compliance with an annual concentration limitation in the permittee's individual VPDES permit. Existing facilities that are not expanding are not required to install treatment however any facility that does install nutrient removal (to meet annual load limitations in the watershed general permit discussed above) is required to meet an annual concentration limitation consistent with the technology installed. These technology-based annual concentration limits serve to maximize the return on investments in wastewater treatment infrastructure as well as ensure a steady supply of credits under the watershed general permit.

100% of the significant dischargers are registered under the watershed general permit and are subject to final WLAs as of January 1, 2011. Existing non-significant facilities with individual VPDES permits are covered by rule under the watershed general permit until such time as they expand. The watershed general permit currently includes 41 non-significant dischargers. All other non-significant facilities have coverage under the appropriate VPDES general permit (e.g. domestic discharges less than 1,000 gpd, Car Wash, Concrete, Cooling Water, Nonmetallic Mineral Mining)

Details on DEQ's inspections (<http://www.deq.virginia.gov/vpdes/checklist.html>) and enforcement (<http://www.deq.virginia.gov/enforcement/homepage.html>) programs are available on DEQ's website.

### **Combined Sewer System**

Portions of three Virginia localities -- Alexandria, Lynchburg and Richmond -- are served by a CSS (sewer pipes conveying both domestic wastewater and storm water). Under rainfall-induced high flow conditions, these systems may overflow with a combination of sanitary wastewater and storm water discharged into streams and rivers. CSS nutrient and sediment loads in the CSO must be accounted for in the Bay TMDL. This includes both the discharges from CSO outfalls and the portion of combined sewer flow above the dry-weather design capacity that is conveyed and treated at the wastewater plant. CSS communities must strike a balance between: (1) treating the maximum amount of combined flow at their wastewater plant to avoid overflows that could cause bacterial contamination of surface waters; and (2) not overloading the plant with dilute wastewater that could have long-term impacts on treatment efficiency.

The following information reflects estimated nutrient and sediment load data for these combined systems and consists of annual nutrient and sediment loads for (1) discharges from the CSO outfalls and (2) the captured combined sewer flows that are conveyed, treated, and discharged from the wastewater plants serving the CSS communities. The load data are based on the current design capacities of each community's CSO control facilities (including combined flows eliminated thus far by sewer separation). With the exception of Alexandria, where the LTCP consists of the Nine Minimum Controls (NMC) (including maximizing combined sewer flows to the Alexandria Sanitation Authority's advanced wastewater treatment plant), these loads generally represent LTCP implementation to date. Therefore, the loads reflect existing control facilities and operations within the CSS rather than complete implementation of the controls and operations described in the approved LTCPs. The Alexandria CSO discharge volumes and loads reflect their approved post-LTCP conditions. It is important to note that the communities have already achieved virtually all of the nutrient load reductions and much of the sediment load reductions associated with their CSO control programs by virtue of having maximized combined flows through complete treatment. Therefore, little additional nutrient and sediment reductions are expected from continued implementation of Richmond's and Lynchburg's LTCPs.

In accordance with EPA Guidance (EPA 2009), the loads are expressed as mass loads (lbs/yr). Additional notes are provided (Element 8) to give direction to permit writers so that the combined sewer flow WLAs are properly addressed in the communities' permits.

As noted under Element 1, the load data are based on the current design capacities of each community's CSO control facilities (including combined flows eliminated thus far by sewer separation). The proposed WLAs are based upon each community's CSS models using conditions reflective of the current status of their CSO LTCP implementation. These WLAs are also based on the average of the 10 year period (1991-2000). The CSS conditions are based on the LTCPs and NPDES permit requirements to provide reasonable assurance that the WLAs for the CSS will be achieved.

Alexandria's approved LTCP employs a capture and treat approach to CSO control. The City also continues implementing the Nine Minimum Controls (NMC) (weblink to this and other details on these controls are provided in Element 6), including maximizing flow to the Alexandria Sanitation Authority's (ASA) advanced water reclamation plant, as a requirement of its permit. The City also is required by its permit to conduct an extensive post-construction monitoring program for the remainder of its combined sewer system. Lynchburg's LTCP originally called for complete sewer separation, but the LTCP is now being updated and may be revised to provide for conveyance and treatment of combined flow in the downtown area rather than separating that part of its system. Richmond's LTCP calls for conveyance, storage, and treatment of combined flows as well as limited sewer separation.

The communities are at different stages in the implementation of their LTCPs. Alexandria has completed LTCP implementation and is now conducting its post-construction monitoring program as required by EPA's CSO Control Policy. Lynchburg has separated approximately half of its combined system as required by its VPDES permit and State consent special order. Richmond has completed construction of extensive combined sewer conveyance, storage and treatment facilities. Both the Richmond and Lynchburg orders establish schedules for construction of the controls in their LTCPs. Neither city is expected to complete construction

until after 2025 given the magnitude of the estimated remaining costs (\$340 million for Lynchburg, and \$500 million for Richmond in today's dollars). Both of these cities are required by their VPDES permits to continue implementing the NMC, including maximizing combined flows to their wastewater treatment plants.

The communities' discharge combined sewer flows from both individual CSO outfalls and from the wastewater treatment plants serving their combined sewer systems. Discharges from CSO outfalls occur during rainfall events that produce combined flows exceeding the wet weather design capacities of the conveyance, storage and treatment facilities. In order to meet the applicable water quality-based requirements, the communities have either significantly reduced or are in the process of significantly reducing the volume, duration and number of discharges from their CSO outfalls. This is accomplished by conveying, storing and treating the combined flows and/or by separating parts of their combined sewer systems. Combined flows that do not exceed the design capacities of the conveyance, storage, and treatment facilities are conveyed to and treated at the treatment plants serving the communities. Currently, combined flows conveyed to the treatment plants receive complete treatment. Consistent with EPA's CSO Control Policy, however, future controls will include treatment and/or removal of combined sewer flows to address local bacteria-related water quality impacts.

This proposed approach is consistent with the CSO Policy because both the Policy and this proposed approach call for permits for combined sewer systems to use narrative requirements and performance standards (including requirements to implement the Nine Minimum Controls) in lieu of numeric effluent limits to ensure that the CSO controls are operated as designed and constructed. This approach is also consistent with EPA's memorandum "Establishing TMDL WLAs for Storm Water Sources and NPDES Permit Requirements Based on those WLA" (November 22, 2002) (Element 6). As a result, this approach provides the reasonable assurance required of the TMDLs because (1) each community's CSO control program is incorporated in its VPDES permit, (2) the WLAs will be based on the 1991-2000 rainfall period used to develop the TMDLs, and (3) compliance with the communities' CSO control programs can be expected to limit any exceedance of the WLAs to years that are wetter than or involve rainfall patterns different from those that occurred during the critical rainfall period.

## 4.2. Accounting for Growth

EPA guidance for development of the Bay TMDL and WIPs provides two approaches to account for growth:

- Designate explicit target loads in the TMDL for anticipated growth; this decreases allocations available for existing sources; OR,
- Do not designate explicit target loads for growth, but "offset" any new or increased loads in the future with reductions elsewhere.

### WLA for Significant Facilities

The WLAs for significant facilities have been set at 2010 design capacity of wastewater plants to recognize planning and investment made to provide treatment for future growth into the foreseeable future. These significant WLAs have some built-in growth allowances, being based on total design flow and concentrations that are in most cases less stringent than the current

limits of technology. A recent review of the compliance plans submitted annually by the dischargers subject to the Chesapeake Bay Watershed General Permit shows that sufficient nutrient credits are expected to be available over the next 5 to 10 years. This is due to a combination of the municipal plants currently using only about 65% of their design capacity and several plants being upgraded with NRT that exceeds the performance basis of their WLA

#### **WLA for Non-significant Facilities with Individual VPDES Permits**

The WLAs for non-significant facilities with individual VPDES permits are based upon the 2005 permitted design capacity. New municipal facilities with a design flow greater than 1,000 gpd are required to offset their entire load and register under the watershed general permit.

The WLAs for non-significant industrial facilities with individual permits are estimates of current loads using limited Discharge Monitoring Report data and typical effluent concentrations established by Standard Industrial Classification (SIC) codes. The industrial non-significant estimates are considered to be very conservative and the Commonwealth expects actual loads to be considerably less once data is collected from these facilities.

DEQ will begin requiring periodic nutrient monitoring from industrial non-significant facilities to compare with the aggregate WLAs included in the WIP. Non-significant municipal loads will continue to be estimated using discharged flows and default nutrient concentrations. As these load estimates are refined, the WIP may be modified to include more accurate WLAs. Until the gaps identified in Element 4 are addressed, DEQ will also track the addition of any new loads for new or expanding non-significant facilities that are not currently subject to the offset requirements in the current watershed general permit to ensure that the overall aggregate WLAs are maintained.

#### **WLAs for Non-significant Discharges with Coverage under the Domestic Discharges less than 1,000 GPD VPDES General Permit**

WLAs for Virginia's general permit for domestic discharges less than 1,000 gpd are based upon the 1,000 gpd flow authorized by the permit and effluent concentrations of 18.7 mg/l TN and 2.5 mg/l TP. Actual flows from these facilities are typically about one third of the permitted capacity, creating ample excess allocation to accommodate new dischargers in this category for the foreseeable future.

#### **WLA for Non-significant Industrial Discharges with Coverage under a Car Wash, Concrete, Cooling Water, and Nonmetallic Mineral Mining VPDES General Permit**

WLAs for these discharges were based upon conservative assumptions (365 days/yr operations, etc.) so the existing non-significant dischargers are expected to discharge less than their aggregate WLA. Should the reserve capacity inherent in the WLAs prove to be inadequate to accommodate growth in this sector, Virginia will determine if additional requirements will be needed during the reissuance of each general permit regulation to address new discharges to meet for Stage II of requirements of the TMDL.

#### **Other Options to Meet WLAs**

As basin caps are approached into the future, additional facilities will need to install more stringent NRT treatment, as well as explore options such as reclamation/reuse and point to



nonpoint source trading. Virginia has adopted a Water Reclamation and Reuse Regulation (9 VAC 25-740) (<http://www.deq.virginia.gov/vpa/waterreuse.html>) and is actively promoting reuse as a water management tool and as means of accommodating growth under the nutrient caps. Virginia has also adopted guidance for the generation of offsets from agricultural Best Management Practices ([http://www.deq.virginia.gov/export/sites/default/vpdes/pdf/VANPSTradingManual\\_2-5-08.pdf](http://www.deq.virginia.gov/export/sites/default/vpdes/pdf/VANPSTradingManual_2-5-08.pdf)). The combination of adequate wasteload allocations, more advanced nutrient removal technologies, water reclamation and reuse, and point-to-nonpoint source trading is expected to provide adequate capacity to accommodate growth in the wastewater sector through Stage II of the TMDL.

### **Combined Sewer System**

This is discussed under WIP Section 6.A.3. For significant dischargers' WLA CSS loads are not expected to grow simply because construction of new combined sewers is prohibited. It is also possible that allocations will be adjusted in 2017 to account for improved stormwater management practices in the watershed that feed the CSS systems. Improved infiltration and control of stormwater will reduce the flow to these systems and potentially reduce the frequency of overflows and the resultant nutrient loads discharged into Virginia waters.

### **4.3. Gap Analysis**

Current Virginia law, regulation and permits generally provide the assurance needed to meet the wastewater nutrient target loads. Legislation passed in 2010 provided two new authorities:

- HB1290: Eastern Shore facilities can acquire credits from facilities in the Potomac and Rappahannock basins.
- HB1135: New municipal dischargers (greater than 1,000 gallon per day (gpd) but less than 39,999 gpd) commencing discharge after January 1, 2011, must offset their nutrient loads.

However, there are some minor "gap" issues in the existing regulations that need to be addressed. For example, the 2010 legislation doesn't cover existing plants with a design flow less than 40,000 gpd that are expanding but will still be under 40,000 gpd. Also not addressed are smaller, new municipal wastewater systems under 1,000 gpd and industrial plants below 40,000 gpd. The possibility for legislative or regulatory amendments to resolve these issues will be evaluated as implementation under the Bay TMDL proceeds, further described in the next element.

For existing facilities, the "gap" that exists is the ability of the significant dischargers to meet their final wasteload allocations. As discussed under Element 2, these facilities are all permitted under the watershed general permit and are on schedule to meet the aggregate WLA beginning in 2011. Existing non-significant facilities have been assigned WLAs equal to their "permitted design capacity" as discussed under Element 2. Due to the reliance on design flow in establishing permitted design capacities, the existing non-significant dischargers are expected to discharge less than their aggregate WLA. The only "gap" that exists therefore is the ability to accommodate future growth.

## **Combined Sewer System**

This is discussed under WIP Section 6.A.4 for significant dischargers' WLA. The communities have already achieved almost all of the nutrient load reductions and much of the sediment load reductions associated with their CSO control programs by virtue of having maximized combined flows through complete treatment. Furthermore, independent of their CSO control obligations discussed above (Element 2), the communities are currently on target to achieve nutrient reductions at their treatment plants by the end of 2010 as called for by the Chesapeake Bay Tributary Strategy. While Richmond's LTCP (and possibly Lynchburg's LTCP) calls for the installation of additional capacity to treat larger combined flow volumes in the future, this capacity is associated with disinfection facilities. This additional treatment capacity will transfer some of the nutrient and sediment load now discharged from CSO outfalls to the treatment plant.

## **4.4. Strategy to Fill Gaps**

2011 - Continue Existing Water Quality Management Planning Regulation (9 VAC 25-720) and Chesapeake Bay Watershed General Permit Regulation (9 VAC 25-820) with current loading allocations with additional pre-2017 reduction in the James River.

### **Non-significant Facilities with Individual VPDES Permits**

Wastewater dischargers in the Bay watershed operate under both individual discharge and Watershed General permits; the Commonwealth's overall commitment of ensuring compliance is through administration and enforcement of these permits. The following new and expanding facilities are required to register under the watershed general permit and offset any increase in nutrient load:

- New municipal facilities with a design flow greater than 1,000 gpd
- Expanding municipal facilities with a design flow of 0.04 MGD or more
- New or expanding industrial facilities with a TN or TP load greater than or equal to that of a 0.04 MGD municipal facility

Historically, Virginia has seen very few applications for (1) municipal expansions less than 0.04 MGD or (2) industrial discharges of nutrients. It is believed that with the conservative assumptions in the permitted design capacity calculations (e.g. design flow, 365 day/year operations, etc.) there is ample capacity in the aggregate Nonsignificant wasteload allocations to accommodate any new applications in these two categories during Phase I of the TMDL (until 2017). DEQ will be gathering additional information of the existing loads as well as tracking new applications. The strategy of accommodating any new loads in these two categories within the existing aggregate wasteload allocation will be further evaluated.

- Seek legislative changes to establish requirement for offsetting loads for discharger that expand to less than 40,000 gpd.

### **Non-significant Discharges with Coverage under the Domestic Discharges less than 1,000 GPD VPDES General Permit**

Actual flows from these facilities are typically about one third of the permitted capacity, creating ample excess allocation to accommodate new dischargers in this category for the foreseeable future. More long term the Commonwealth will:

- Seek legislative changes necessary to require offsets for nutrient loads of less than 1000 gpd either as separate legislation or as a component of amendments to the Nutrient Credit Exchange.

#### **WLA for Non-significant Industrial Discharges with Coverage under a Car Wash, Concrete, Cooling Water, and Nonmetallic Mineral Mining VPDES General Permit**

Should the reserve capacity inherent in the WLAs from these general permits prove to be inadequate to accommodate growth in this sector, Virginia will determine if additional requirements will be needed during the reissuance of each general permit regulation to address new discharges to meet for Stage II of requirements of the TMDL.

### **4.5. Contingencies**

DEQ's Compliance and Enforcement Program for wastewater permit requirements is the mechanism that will be employed to ensure timely implementation to achieve waste load allocations.

- Contingency: Offsets Among Source Sectors
  - Assessing compliance with 2-year milestones will be based upon total loadings, not by compliance with individual source sector allocations.
  - Wastewater treatment plants can operate below their assigned allocations:
    - During early years, treatment efficiency is better while wastewater flows are below the design capacity.
    - Meeting permitted nutrient concentrations is attainable using installed technology and treatment facilities are typically operated at levels below the limits to ensure compliance.
  - Excess "credits" from the wastewater sector can be used to offset loads in other sectors that exceed their allocations; this will aid in meeting the Commonwealth's overall target load until 2017.

### **Combined Sewer System**

Although all of the communities have adopted the demonstration approach in their LTCPs, each is implementing a different DEQ-approved CSO control program based on local factors and circumstances as presented under Element 2.

Below are links to their websites for additional information.

<http://www.richmondgov.com/dpu/projectCombinedSewerOverflowTimeline.aspx>

<http://www.lynchburgva.gov/index.aspx?page=3326>  
<http://alexandriava.gov/tes/oeq/info/default.aspx?id=3844>

VPDES Permits issued to municipalities with CSSs that have CSOs require implementation of the NMCs and LTCPs. The NMCs are developed and implemented on a site-specific basis to minimize the impact of CSOs on receiving water bodies, while the LTCPs are designed to provide for additional CSO controls where needed to achieve compliance with applicable water quality standards. The NMCs and LTCPs are imposed as enforceable requirements of the communities NPDES permits. DEQ's Compliance and Enforcement Program for wastewater permit requirements is the mechanism that will be employed to ensure compliance with the requirements of the VPDES permit, including water quality-based effluent limits that are based on the waste load allocations.

#### **4.6. Tracking and Reporting Protocols**

Wastewater dischargers are required to track and report under their discharge permits, both the Watershed General Permit for annual loads and individual permits for concentration-based nutrient limits.

The specifics of current annual reporting requirements for dischargers under the Watershed General Permit are:

On or before February 1 each year, the permittee shall either individually or through the Virginia Nutrient Credit Exchange Association file a report with DEQ. The report shall identify:

- The annual mass load of total nitrogen and the annual mass load of total phosphorus discharged by each of its permitted facilities during the previous calendar year;
- The delivered total nitrogen load and delivered total phosphorus load discharged by each of its permitted facilities during the previous year; and
- The number of total nitrogen and total phosphorus credits for the previous calendar year to be acquired or eligible for exchange by the permittee

As mentioned previously, all dischargers under the Watershed General Permit are also required to annually submit to DEQ, either individually or through the Virginia Nutrient Credit Exchange Association, an update to their compliance plans for approval. The compliance plans must contain any capital projects and implementation schedules needed to achieve total nitrogen and phosphorus reductions sufficient to comply with the individual and combined waste load allocations of all the dischargers in the tributary as soon as possible.

Discharge Monitor Reports of annual TN and TP load limits (calendar year) are required in the Nutrient Watershed GP for registered facilities. The permit allows for trading of compliance credits to provide dischargers additional flexibility in meeting their annual load limitations. As of April 1<sup>st</sup> of each year, DEQ publishes an annual discharge report listing TN and TP loads from all the facilities covered by the general permit in the previous calendar year. The facilities then

have two months (until June 1<sup>st</sup>) to complete any trades and notify DEQ. By July 1<sup>st</sup>, DEQ will publish an annual load compliance report listing trades of compliance credits and identify facilities that are in excess of their annual load limit. For any facility that discharged in excess of their annual load limit, compliance cannot be determined until the DEQ publishes this annual load compliance report the following July 1<sup>st</sup>. Both of these reports are made available on DEQ's nutrient trading webpage (<http://www.deq.virginia.gov/vpdes/nutrienttrade.html>) and all documents relating to the exchanges are available to any person requesting them.

As discussed under Element 3, the aggregate TN and TP wasteload allocations for non-significant industries are considered to be conservative “placeholders” at this time. DEQ will adopt procedures to add nutrient reporting requirements to non-significant industrial permits to establish better estimates of these loads over the coming years. Once better estimates of these loads are generated, the WIP may be adjusted accordingly.

DEQ does not have the capability to provide EPA electronic information through PCS for the Nutrient Watershed GP. DEQ is a full-batch state and currently faces an enormous challenge of development and implementation of data transmission to ICIS for individual Major and Nonmajor VPDES permits. It is anticipated that this project will take until 2014. DEQ does not expect to have the resources to develop the capability for providing Nutrient Watershed general permit data through ICIS in the foreseeable future. Separately from the PCS/ICIS database, DEQ will provide facility permit limit, compliance schedule, compliance, and annual discharge information contained in the Nutrient Watershed GP module of DEQ's Comprehensive Environmental Data System (CEDS). DEQ will also provide EPA the April 1 and the July 1 DEQ reports as well as Nutrient Watershed GP annual load information as part of EPA's milestone calendar year based reporting schedule. In addition, grant funding has been requested for the development of software programming to more easily generate reports on annual nutrient loads from DEQ's CEDS to facilitate tracking of nutrient loads.

### ***Combined Sewer System***

The CSS conditions are based on the LTCPs and NPDES permit requirements to provide reasonable assurance that the WLAs for the CSS will be achieved. According to EPA's CSO Control Policy (below), permitting authorities are instructed to include LTCP-derived performance standards and requirements based on average design conditions in NPDES permits issued to those CSO communities that have developed LTCPs using the demonstration approach.

Instead of requiring real-time effluent monitoring for individual CSS outfalls, the communities' VPDES permits provide for monitoring based on calibrated system flow modeling and event mean concentrations (“EMC”) data from sampling at representative outfalls. The modeled flows and EMC data are used to calculate and report discharged loads on either a system-wide or individual CSO outfall basis for each rainfall event. The compliance demonstration is based on reported system performance compared to the LTCP-derived performance standards and requirements in the permit and the results of the post-construction monitoring program.

USEPA's Combined Sewer Overflows – Nine Minimum Controls Control Policy:  
[http://cfpub.epa.gov/npdes/cso/cpolicy.cfm?program\\_id=5](http://cfpub.epa.gov/npdes/cso/cpolicy.cfm?program_id=5)

Other Useful Links:

- USEPA, National Pollutant Discharge Elimination System: Combined Sewer Overflows [http://cfpub.epa.gov/npdes/home.cfm?program\\_id=5](http://cfpub.epa.gov/npdes/home.cfm?program_id=5)
- USEPA, National Pollutant Discharge Elimination System: Combined Sewer Overflows – CSO Control Policy, Elements of a Long-Term Control Plan. [http://cfpub.epa.gov/npdes/cso/ltpplan.cfm?program\\_id=5](http://cfpub.epa.gov/npdes/cso/ltpplan.cfm?program_id=5)
- USEPA, Combined Sewer Overflow: Guidance for Permit Writers, Washington, DC: August 1995. <http://cfpub.epa.gov/npdes/cso/guidedocs.cfm>
- USEPA “Establishing TMDL WLAs for Storm Water Sources and NPDES Permit Requirements Based on those WLA” (November 22, 2002). <http://www.epa.gov/owow/tmdl/stormwater/>

## 4.7 Outstanding Issues That Need To Be Addressed

This section was constructed based on information provided by EPA and other sources. The following are issues that require additional investigation and data improvement.

- 1) The watershed model (V5.3) contains incorrect CSO acreage for Virginia’s three facilities.
- 2) In order to properly characterize and capture loads, time-series data are needed for the dry water flow plus CS-capture. Based on multiple conversations (July 27, August 11, and November 10, 2010), EPA is aware of this problem but indicated that WWTP flow and load in the WIP will be applied as a constant value for the period 1991-2000 for the purpose of testing the WLAs during Phase I. Appropriate action is needed to incorporate these changes in Phase II.
- 3) The watershed model (V5.3) contains incorrect Lynchburg’s CSS loads.